



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,962	01/22/2004	Robert D. Huttemann	HUTTEMANN 9-2	6344
27964	7590	06/02/2005	EXAMINER	
HITT GAINES P.C. P.O. BOX 832570 RICHARDSON, TX 75083			OWENS, DOUGLAS W	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/762,962	Applicant(s) HUTTEMANN ET AL.	
	Examiner Douglas W. Owens	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-28, 30-33, 36 and 37 is/are rejected.
- 7) ☒ Claim(s) 29, 34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 25 – 28, 32, 36 and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,645,821 to Bailey et al.

Regarding claim 25, Bailey et al. teach an integrated circuit (Fig. 1, for example), comprising:

transistors (Col. 2, lines 44 – 46);

interconnects (100; Col. 2, lines 46 – 54) formed in dielectric layers (50, 90)

located over the transistors that interconnect the transistors to form an operative integrated circuit; and

a thin film resistor device interconnected to the transistors, including:

a resistive layer (60) located on a first dielectric layer (50);

first and second contact pads (70) located atop the resistive layer; and

a second dielectric layer (110) located over the resistive layer and the first and second contact pads.

Art Unit: 2811

Regarding claim 26, Bailey et al. teach an integrated circuit further including a first and second interconnect (100) that contacts the first and second contact pads respectively.

Regarding claim 27, Bailey et al. teach an integrated circuit further including interconnect metallization structures (40) wherein the first dielectric layer (50) is located between the interconnect metallization structure and the resistive layer.

Regarding claim 28, Bailey et al. teach an integrated circuit, wherein each of the first and second interconnects contact an interconnect metallization structure (Abstract; Col. 3, lines 16 – 20).

Regarding claim 32, Bailey et al. teach an integrated circuit, wherein the resistive layer includes tantalum nitride (Col. 3, lines 27 – 30).

Regarding claim 36, Bailey et al. teach an integrated circuit, wherein the resistive layer has a thickness ranging from 5 – 200 nm (Col. 3, lines 30 and 31), which includes the range of 20 – 80 nm.

Regarding claim 37, this is considered a suggested use limitation and has not been given any patentable weight.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2811

4. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bailey et al.

Bailey et al. teach that interconnects may be made of aluminum (Col. 2, lines 49 – 51). Bailey et al. do not teach an integrated circuit, wherein the first and second interconnects (100) comprise aluminum. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use aluminum for the first and second interconnects, since it is desirable to use materials that are well suited for the intended use.

5. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bailey et al. as applied to claims 26 and 30 above, and further in view of US Patent No. 6,424,040 to Nag et al.

Bailey et al. teach an integrated circuit, wherein the interconnects can comprise aluminum. Bailey et al. do not teach an integrated circuit, wherein the interconnects comprise a Ti/TiN/Al/TiN stack. Nag et al. teach an integrated circuit, wherein a typical interconnect comprises a Ti/TiN/Al/TiN stack (Col. 1, lines 25 – 28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Nag et al. into the device taught by Bailey et al., since it is desirable to prevent unwanted diffusion of Al, as well as provide an adhesion layer for the TiN barrier layer.

6. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bailey et al. as applied to claim 25 above, and further in view of US Patent No. 4,161,431 to Matshunaga et al.

Bailey et al. do not teach an integrated circuit, wherein the resistive layer includes tantalum pentoxide. Matshunaga et al. teach an integrated circuit, wherein the resistive layer includes tantalum pentoxide (Col. 3, lines 47 – 51). It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Matshunaga et al. into the device taught by Bailey et al., since it is desirable to use materials that are well suited for the intended use.

7. Claims 29, 34 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to claims 25 – 28, 30 – 33, 36 and 37 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2811

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W. Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Douglas W Owens
Examiner
Art Unit 2811

DWO